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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/774,990

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Matthew J. Amatangelo

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02/28/2008

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EXAMINER

PATEL, SHAMBHAVI K

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/774,990	Applicant(s) AMATANGELO ET AL.	
	Examiner SHAMBHAVI PATEL	Art Unit 2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4,6,8-10 and 16-20 is/are pending in the application.
- 4a) Of the above claim(s) 6,8-10 and 16-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. A **request for continued examination** under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on **20 December 2007** has been entered.

2. Claims 1-4, 6, 8-10 and 16-20 have been presented for examination. Claims 1-4 have been elected by Applicant for prosecution.

Response to Arguments

3. In view of Applicant's amendments, the previously issued 112 rejections are withdrawn. The Examiner notes that a new 35 U.S.C. 112 rejection has been issued below in view of the newly amended limitations.

4. Applicant's arguments with respect to the 35 U.S.C. 102 rejection of claims 1-4 have been considered but are moot in view of the new ground(s) of rejection.

Restriction

5. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-4, drawn to modeling the static timing behavior of a combinatorial gate, classified in class 703, subclass 14.
- II. Claims 6-10, drawn to classifying a combinatorial gate, classified in class 703, subclass 14.
- III. Claims 16-20, drawn to a static timing engine, classified in class 703, subclass 19.

Inventions I, II and III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination I has separate utility such as modeling the behavior of a gate, subcombination II has separate utility such as classifying a combinatorial gate, and subcombination III has separate utility such as a static timing engine. See MPEP § 806.05(d).

The examiner has required restriction between subcombinations usable together. Where applicant elects a subcombination and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise

requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

6. During a telephone conversation with John Kethcum on 20 February 2008, a provisional election was made with traverse to prosecute the invention of group I, claims 1-4. Affirmation of this election must be made by applicant in replying to this Office action. Claims 6, 8-10 and 16-20 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. **Claims 1-4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite** for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding **claim 1**, the terms “evaluate node”, “dynamic circuit”, “labeling”, “near dynamic circuit” and “dynamic signal” are vague and indefinite. All other claims are rejected by virtue of their dependency.

8. **Claims 1-4 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete** for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted step is: modeling the static timing behavior of the combinatorial gate.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

9. **Claims 1-4 are rejected under 35 U.S.C. 101** because the claimed invention is directed to non-statutory subject matter. The Examiner asserts that the current state of the claim language is such that a reasonable interpretation of the claims would not result in any useful, concrete or tangible product. **Claim 1** is directed to modeling the static timing behavior of a combinatorial gate. More specifically, the claimed subject matter provides for propagating the output signal of the combinatorial gate as a dynamic signal. This produced result remains in the abstract and, thus, fails to achieve the required status of having real world values. All other claims are rejected by virtue of dependency.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. **Claims 1, 3 and 4 are rejected under 35 U.S.C. 102(b)** as being clearly anticipated by Norton (“Transistor-level Sizing and Timing Verification of Domino Circuits in the Power PC Microprocessor” 1997).

Regarding claim 1:

Norton discloses a computer-implemented method of modeling the static timing behavior of a combinatorial gate comprising:

- a. determining that a data signal has been propagated to a first input of the combinatorial gate
(section 4.1 1st-2nd paragraphs: footed and footless gates have both data and clock signal inputs)

- b. determining that a clock signal has been propagated to a second input of the combinatorial gate
(**section 4.1 1st-2nd paragraphs: footed and footless gates have both data and clock signal inputs**)
- c. determining that an output signal of the combinatorial gate has been propagated to an evaluate node of a dynamic circuit (**section 4.3 1st paragraph: output is an input to another domino circuit**)
- d. labeling the combinatorial gate as a near dynamic circuit (**section 4.2: classified as dynamic nodes**)
- e. propagating the output signal of the combinatorial gate as a dynamic signal (**figure 2; section 4.3 1st paragraph**)

Regarding claim 3:

Wang discloses the method of claim 1 propagating the data signal includes includes causing a later arriving edge of the data signal to cause the output signal to respond (**section 4.3**)

Regarding claim 4:

Wang discloses the method of claim 1 wherein: the data signal includes a single edge per clock period; and, when propagating the data signal, the single edge is propagated through the combinatorial gate (**figure 2; section 4.3**).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Norton (“Transistor-level Sizing and Timing Verification of Domino Circuits in the Power PC Microprocessor” 1997) in view of Zhao (“Timing-Driven Partitioning and Timing Optimization of Mixed Static-Domino Implementations”, 2000).**

Regarding claim 2:

Norton does not explicitly disclose the method of claim 1 further comprising performing a reverse traversal function on a circuit design containing the combinatorial gate. **Zhao teaches** performing reverse traversals on circuit designs containing both static and domino circuits (**Zhao: page 1329 “Determining the Candidate Cut Nodes” reverse PERT traversal**). At the time of the invention, it would have been obvious to one of ordinary skill in the art to combine the teachings of Norton and Zhao because the methodology of Zhao minimizes implementation costs while meeting timing constraints (**Zhao: section III page 1332 left column 2nd complete paragraph**).

Conclusion

12. Examiner's Remarks: Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner. In the case of amending the claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on for proper interpretation and also to verify and ascertain the metes and bounds of the claimed invention.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shambhavi Patel whose telephone number is (571) 272-5877. The examiner can normally be reached on Monday-Friday, 8:00 am – 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on (571) 272-22792279. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SKP

/Kamini S Shah/

Supervisory Patent Examiner, Art Unit 2128

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